

## CURRICULUM VITAE

**Erik Richard Swenson, M.D.**

January 2002

### PERSONAL:

Birth

Social Security Number

### EDUCATION:

College	Princeton University Princeton, New Jersey Major: Biochemical Sciences Degree: A.B. cum laude	1970-1974
Medical School	University of California, San Diego La Jolla, California Degree: M.D.	1974-1979

### POSTGRADUATE TRAINING:

Fellowship	Pharmacology University of Florida Gainesville, Florida	1976-1977 1979-1980
Residency	Internal Medicine Hospital of the University of Pennsylvania Philadelphia, Pennsylvania	1980-1983
Fellowship	Pulmonary/Critical Care Medicine University of Washington Seattle, Washington	1983-1985
Fellowship	Respiratory Medicine Hammersmith Hospital Royal Postgraduate Medical School University of London London, England	1986-1987

**FACULTY POSITIONS HELD:**

Acting Assistant Professor of Medicine Division of Respiratory Diseases University of Washington Seattle, Washington	1985-1986
Assistant Professor of Medicine Division of Pulmonary & Critical Care Medicine University of Washington	1987-1992
Associate Professor of Medicine Division of Pulmonary & Critical Care Medicine University of Washington	1993-1999
Visiting Scientist Abteilung für Sport- und Leistungsmedizin Universität Heidelberg Heidelberg, Germany	1996-1997
Professor of Medicine Division of Pulmonary & Critical Care Medicine University of Washington	2000-present

**HOSPITAL POSITIONS HELD:**

Staff Physician in Medicine Veterans Affairs Medical Center Seattle, Washington	1985-1986 1987-present
---	---------------------------

**HONORS:**

Pharmaceutical Manufacturers Association Medical Research Award	1976-1977
Fellow, American Lung Association of WA	1984-1985
NIH National Research Service Award	1985-1987

**BOARD CERTIFICATION:**

Internal Medicine ( ——— )	1983
Pulmonary Disease ( ——— )	1986
Critical Care Medicine ( ——— )	1987

**LICENSURE:**

Washington ( ——— )	1983-present
--------------------	--------------

**PROFESSIONAL ORGANIZATIONS:**

Mount Desert Island Biological Laboratory  
Washington Thoracic Society  
American Thoracic Society  
American Physiological Society

International Society for Mountain Medicine

**GRANT SUPPORT:**

Principal investigator: VA Merit Review Award Lung carbonic anhydrase in $V_A/Q$ matching.	12/1/90- 12/31/91
Principal investigator: NIH FIRST Award, NHLBI # HL 45571 Lung carbonic anhydrase in $V_A/Q$ matching.	12/1/91- 12/31/95
Co-investigator: NIH PPG (PI: MP. Hlastala), NHLBI # HL 24163 Mechanisms of heterogeneity in the lung	7/1/94 - 6/30/99
Principal investigator: NIH RO1 Award, NHLBI # HL 45571 Temporal heterogeneity of lung $V_A$ and Q	2/1/96- 1/31/01
Project # 3 Leader: NIH PPG (PI: MP. Hlastala), NHLBI # HL 24163 Influence of inspired gases on ventilation-perfusion matching	7/1/99 - 6/30/05
Principal Investigator: Montelukast in acute mountain sickness (AMS) SING-US-105-99, Merck	1/1/00 - 12/31/02

**NATIONAL/INTERNATIONAL RESPONSIBILITIES:**

Director and Organizer, Fifth International Symposium on the Carbonic Anhydrases  
Fort Worden State Park; May 22-25, 2000  
Study Section, Veterans Affairs Merit Review Committee-Respiration Section  
Scientific Advisory Committee, Mt. Desert Island Biological Laboratory  
Editorial Board, Bulletin of the Mt. Desert Island Biological Laboratory  
Steering Committee, Respiration Section of the American Physiological Society  
Associate Editor, High Altitude Medicine and Biology  
Executive Committee, International Society for Mountain Medicine  
NIH Respiratory and Applied Physiology Study Section: Ad hoc member, June 1999  
NIH Lung Biology and Pathology Study Section: Ad hoc member, February 2000  
Swiss National Science Foundation: Ad hoc reviewer  
Deutsche Forschungsgemeinschaft: Ad hoc reviewer  
Natural Sciences and Engineering Research Council of Canada: Ad hoc reviewer

**LOCAL RESPONSIBILITIES**

Ethics Advisory Committee, VA Puget Sound Health Care System  
Scientific Review Committee, VA Puget Sound Health Care System  
Critical Care Committee, VA Puget Sound Health Care System

## BIBLIOGRAPHY:

### ORIGINAL PEER REVIEWED PUBLICATIONS:

1. Maren TH, Swenson ER, Addink ABC: The rates of ion movement from plasma to endolymph in the dogfish, *Squalus acanthias*. Ann Otol Rhinol Laryngol 84:847-858, 1975.
2. Maren TH, Wistrand P, Swenson ER, Talalay ABC: Rates of ion movement from plasma to aqueous humor in the dogfish, *Squalus acanthias*. Invest Ophthalmol 14:662-673, 1975.
3. Swenson ER, Maren TH: A quantitative analysis of CO<sub>2</sub> transport at rest and during maximal exercise. Resp Physiol 35:129-159, 1978.
4. Eveloff J, Swenson ER, Maren TH: Carbonic anhydrase activity of brush border and plasma membranes from rat kidney cortex. Biochem Pharmacol 28:1434-1437, 1979.
5. Maren TH, Swenson ER: A comparative study of the kinetics of the Bohr effect. J Physiol 303:535-547, 1980.
6. Sanyal G, Pessah N, Swenson ER, Maren T: Carbon dioxide hydration activity of purified teleost red cell carbonic anhydrase: Inhibition by sulfonamides and anions. Comp Biochem Physiol 73B:937-944, 1982.
7. Sanyal G, Swenson ER, Pessah NI, Maren TH: The carbon dioxide hydration activity of skeletal muscle carbonic anhydrase: Inhibition by sulfonamides and anions. Mol Pharmacol 22:211-220, 1982.
8. Swenson ER, Maren TH: Effects of acidosis and carbonic anhydrase inhibition in the elasmobranch rectal gland. Am J Physiol 247:F86-F92, 1984.
9. Swenson ER, Maren TH: The dissociation of CO<sub>2</sub> hydration and renal acid secretion in the dogfish, *Squalus acanthias*. Am J Physiol 250:F288-F293, 1986.
10. Swenson ER: Severe hyperkalemia as a complication of timolol, a topically applied beta adrenergic antagonist. Arch Int Med 146:1220-1221, 1986.
11. Bomsztyk K, Swenson ER, Calalb M: Low luminal pH and carbonic anhydrase limit bicarbonate accumulation in proximal tubular fluid. Am J Physiol 252:F501-F508, 1987.
12. Swenson ER, Maren TH: Roles of red cell and gill carbonic anhydrase in elasmobranch HCO<sub>3</sub> and CO<sub>2</sub> excretion. Am J Physiol 253:R450-R458, 1987.
13. Gronlund J, Swenson ER, Ohlsson J, Hlastala MP: Contribution of continuing gas exchange to expired gas profiles. J Appl Physiol 62:2467-2476, 1987.
14. Schoene RB, Swenson ER, Pizzo CT, Hackett PH, Roach RC, Mills WJ, Henderson WR, Martin TR: The lung at high altitude: Bronchoalveolar lavage in acute mountain sickness and pulmonary edema. J Appl Physiol 64:2605-2613, 1988.
15. LeBars D, Luthra S, Pike VW, Swenson ER: The radiosynthesis of a <sup>11</sup>C-labeled carbonic anhydrase inhibitor: [carbonyl-<sup>11</sup>C] acetazolamide. Appl Radiat Isot 39:671-675, 1988.
16. Swenson ER, Leatham KL, Roach RC, Schoene RB, Mills WJ, Hackett PH. Renal carbonic anhydrase inhibition reduces high altitude sleep periodic breathing. Respir Physiol. 86:333-343, 1991.

17. Goldberg S, Schoene R, Haynor D, Swenson ER, Morrison J, Bannister E. Brain pH and ventilatory adaptation to high altitude. *J Appl Physiol.* 72:58-63, 1992.
18. Swenson ER, Robertson HT, Polissar N, Middaugh M, Hlastala MP. Conducting airway gas exchange: diffusion related differences in inert gas elimination. *J Appl Physiol.* 72:1581-1588, 1992.
19. Shields AF, Graham MM, Kowaza SM, Kozell LB, Link JM, Swenson ER, Spence AM, Bassingthwaighte JB, Krohn KA. Contribution of labeled CO<sub>2</sub> to PET imaging of 11-C labeled compounds. *J Nucl Med.* 33:581-584, 1992.
20. Maren TH, Fine AR, Swenson ER, Rothman D. Renal acid-base physiology in the marine teleost. *Am J Physiol.* 263:F49-F55, 1992.
21. Potkin RT, ER Swenson. Resuscitation from severe acute hypercarbia: determinants of tolerance and survival. *Chest.* 102:1742-1745, 1992.
22. Swenson ER, Hughes JMB. Effects of acute and chronic acetazolamide on resting ventilation and ventilatory responses in man. *J Appl Physiol.* 74: 230-237, 1993.
23. Swenson ER, Gronlund J, Hlastala MP. *In vivo* contribution of carbonic anhydrase and red cell band 3 protein to lung gas exchange. *J Appl Physiol.* 74:838-848, 1993.
24. Swenson ER, Robertson HT, Hlastala MP. Effects of carbonic anhydrase inhibition on ventilation-perfusion matching in the dog lung. *J. Clin Invest.* 92:702-709, 1993.
25. Domino K, Swenson ER, Polissar N, Eisenstein B, Hlastala MP. Effect of inspired CO<sub>2</sub> on ventilation and perfusion heterogeneity. *J Appl Physiol.* 75:1306-1314, 1993.
26. Campbell, AR, Andress, D, Swenson ER. Identification and characterization of human neutrophil carbonic anhydrase. *J Leukocyte Biol* 55:343-348, 1994.
27. Swenson ER, Robertson HT, Hlastala MP. Effects of inspired CO<sub>2</sub> on V/Q- matching in normoxia, hypoxia and hyperoxia. *Am J Respir Crit Care Med* 149:1563-1569, 1994.
28. Swenson ER, Fine AR, Maren, TH, Reale E, Lacy ER, Smolka A. Physiological and immunocytochemical evidence for a putative H<sup>+</sup>/K<sup>+</sup> ATPase in renal acid secretion in the marine elasmobranch. *Am J Physiol.* 267:F639-F645, 1994.
29. Williams A, Weiner C, Reiff D, Swenson ER, Fuller R, Hughes JMB. Comparison of the effect of inhaled selective and non-selective adrenergic agonists on cardiorespiratory parameters in chronic stable asthma. *Pulmon Pharmacol* 7:235-241, 1994.
30. Swenson ER, Duncan T, Goldberg SV, Ahmad S, Ramirez G, Schoene RB. The effect of hypoxia in humans and its relationship to the hypoxic ventilatory response. *J Appl Physiol* 78:377-383, 1995.
31. Swenson ER, Graham M, Hlastala MP. Acetazolamide slows kinetics of V<sub>A</sub>/Q matching following imposed changes in pulmonary blood flow. *J Appl Physiol* 78:1312-1318, 1995.
32. Domino K, Swenson ER, Hlastala MP. Hypocapnia-induced ventilation-perfusion mismatch: A direct CO<sub>2</sub> or pH-mediated effect? *Am J Respir Crit Care Med.* 152:1534-1539, 1995 .

33. Souders JE, George SC, Polissar NL, Swenson ER, Hlastala MP. Tracheal gas exchange: Perfusion-related differences in inert gas elimination. *J Appl Physiol.* 79:918-928, 1995.
34. Oda D, Savard CE, Nguyen TD, Eng L, Swenson ER, Lee SP. Dog pancreatic duct epithelial cells: Long-term culture and characterization. *Am J Pathol.* 148:977-985, 1996.
35. Swenson ER, MacDonald A, Treadwell A, Allen RL, Vathauer M, Maks C, Schoene RB. Effects of changes in dietary carbohydrate content on symptoms and cytokines in acute mountain sickness. *Aviat Space Environ Med* 68:499-503, 1997.
36. Deem S, Alberts M, Bishop MJ, Bidani A, Swenson ER. Carbon dioxide transport in normovolemic anemia: Complete compensation and lack of change in blood PCO<sub>2</sub> tensions. *J Appl Physiol* 83:240-246, 1997.
37. Domino KB, Emery MJ, Swenson ER, Hlastala MP. Ventilation heterogeneity is increased in hypocapnic dogs but not pigs. *Respir Physiol.* 111: 89-100, 1998.
38. Deem S, Swenson ER, Alberts M, Hedges RG, Bishop MJ. Red cell augmentation of hypoxic pulmonary vasoconstriction: Hematocrit dependence and the importance of nitric oxide. *Am J Respir Crit Care Med.* 157:1181-1186, 1998.
39. Steinacker J, Tobias P, Menold E, Reissnacker S, Hohenhaus E, Liu Y, Lehmann M, Bartsch P, Swenson ER. Lung diffusing capacity and exercise in subjects with previous high altitude pulmonary edema. *Eur Respir J.* 11:643-650, 1998.
40. Oda D, Savard CE, Nguyen TD, Swenson ER, Lee SP. Culture of human main pancreatic duct epithelial cells. *In Vitro Cell Dev Biol* 32:211-216, 1998.
41. Renfro JL, Maren TH, Zeien C, Swenson ER. Renal sulfate secretion is carbonic anhydrase dependent in a marine teleost, *Pleuronectes americanus*. *Am J Physiol. Renal Physiol* 276:F288-F294, 1999.
42. Janas JD, Waugh P, Swenson ER, Hillel A. Effect of thyroplasty on laryngeal airflow. *Ann Otol Rhinol Laryngol* 180:286-292, 1999.
43. Deem S, Hedges RG, McKinney S, Polissar NL, Alberts M, Swenson ER. Improvements in pulmonary gas exchange after hemodilution occur in conjunction with changes in V<sub>A</sub>/Q, pulmonary blood flow distribution and expired nitric oxide. *J Appl Physiol.* 87:132-141, 1999.
44. Tewson TJ, Sttekhova S, Swenson ER. The synthesis and preliminary evaluation of [F-18]-N-p-fluorobenzyl-aminobenzolamide, an inhibitor of carbonic anhydrase IV. *J Labelled Cpd Radiopharm Suppl* 1:42-43, 1999.
45. Deem S, Hedges RG, McKinney S, Polissar N, Swenson ER. Hemodilution during venous gas embolization improves gas exchange without altering V<sub>A</sub>/Q or lung blood flow distributions. *Anesthesiol.* 91:1861-1872, 1999.
46. Hildebrandt W, Ottenbacher A, Swenson ER, Bartsch P. Diuretic effect of hypoxia, hypocapnia and hyperpnea in humans: relation to hormones and O<sub>2</sub> chemosensitivity. *J. Appl. Physiol.* 88:599-610, 2000.
47. Gruenig E, Mereles D, Hildebrandt W, Swenson ER, Bartsch P. Stress-Doppler-echocardiography in normoxia for identification of susceptibility to high altitude pulmonary edema. *J Am Coll Cardiol.* 35:980-987, 2000.
48. Deem S, Kerr M, Berg JT, Swenson ER. Effects of the RBC membrane and increased perfusate viscosity on hypoxic pulmonary vasoconstriction. *J Appl Physiol* 88:1520-1528, 2000.
49. Brogan TV, Hedges RG, Hlastala MP, Robertson HT, McKinney S, Swenson ER. Pulmonary nitric oxide synthase inhibition and inspired carbon dioxide: effects on V<sub>A</sub>/Q matching and pulmonary blood flow distribution in the

dog. Eur Respir J. 16:288-295, 2000.

50. Berg J, Kerr M, Deem S, Swenson ER. Hemoglobin and red cells alter the expired NO response to mechanical forces in isolated lungs and live rabbits. Am J Physiol; Heart and Circulatory Physiol 279:H2947-H2953, 2000.
51. Deem S, Kerr M, Berg JT, Swenson ER. Acetazolamide reduces the rate and magnitude of hypoxic pulmonary vasoconstriction in isolated perfused rabbit lungs. Respir Physiol 123:109-119, 2000.
52. Busch T, Hildebrandt W, Gruenig, Falke K, Bartsch P, Swenson ER. Hypoxia decreases exhaled nitric oxide in mountaineers susceptible to high altitude pulmonary edema. Am J Respir Crit Care Med. 163:368-373, 2001.
53. Tsuruoka S, Swenson ER, Petrovic S, Fujimura A, Schwartz GJ. Role of basolateral carbonic anhydrase in proximal tubular fluid and bicarbonate absorption. Am J Physiol; Renal Physiol 280:F146-F154, 2001.
54. Swenson ER, Tewson T, Ridderstrale Y, Wistrand PJ, Tu C. Biochemical, histological and inhibitor studies of membrane carbonic anhydrase in frog gastric acid secretion. Am J Physiol; Gastrointestinal and Liver Physiol. 281:G61-G68, 2001.
55. Deem S, Berg JT, Gladwin M, Kerr ME, Swenson ER. Effects of S-Nitrosation of hemoglobin on hypoxic pulmonary vasoconstriction and nitric oxide flux. Am J Respir Crit Care Med. 163:1164-1170, 2001.
56. Collier DJ, Nathan J, Swenson ER, Wolff CB, Milledge JS. Benzolamide, a selective carbonic anhydrase inhibitor, prevents acute mountain sickness: possible mechanisms. High Altitude Med Biol. 2002 (in press).
57. Swenson ER, Gibbs JS, Maggiorini M, Mongovin S, Greve I, Pfeiffer F, Mairbaur H, Schwobel F, Weymann Bartsch P. High altitude pulmonary edema is a non-inflammatory high pressure leak of the alveolar-capillary barrier. J Am Med Assoc. 2002 (in press).
58. Jefferson JA, Escudero E, Hurtado M-E, Pando J, Swenson ER, Scheiner GF, Johnson RJ. Cobalt toxicity, excessive erythrocytosis and chronic mountain sickness. Lancet 2002 (in press).

#### MANUSCRIPTS SUBMITTED

1. Hohenhaus E, Swenson ER, Paul A, Jurg H, Bartsch P. Ventilation, gas exchange and fluid balance in acute mountain sickness. Time course and relation to hypoxic ventilatory response. Am J Physiol.
2. Krebs MO, Boehmke W, Seiferheld M, Kaczmarczyk G, Swenson ER. Acetazolamide prevents hypoxic pulmonary vasoconstriction in conscious dogs. J Appl Physiol.
3. Swenson ER, Deem S, Berg J, Kerr M, Bidani A. Inhibition of aquaporin-mediated CO<sub>2</sub> diffusion and apical membrane voltage-gated H<sup>+</sup> channels does not impair pulmonary CO<sub>2</sub> exchange. Clin Science
4. Vaughan D, Brogan TV, Kerr ME, Swenson ER. Nitric oxide isozyme contributions to exhaled NO and hypoxic vasoconstriction in rabbit lungs. Am J Physiol.

#### INVITED REVIEWS AND EDITORIALS

1. Maren TH, Swenson ER. "Physiological consequences of carbonic anhydrase inhibition during rest and exercise and on the Bohr effect" in: Biophysics and Physiology of Carbon Dioxide (ed. by C. Bauer, et al) Springer-Verlag, Berlin, pp. 366-375, 1980.
2. Swenson ER: Respiratory aspects of carbonic anhydrase. Ann NY Acad Sci 429:547-560, 1984.
3. Swenson ER. "Approach to patients with respiratory acid-base disturbances" in Textbook of Internal Medicine (ed. W Kelley) Lippincott Co., Philadelphia, pp 2070-2076, 1989.

4. Swenson ER. "Kinetics of O<sub>2</sub> and CO<sub>2</sub> exchange" in Vertebrate Gas Exchange: Advances in Environmental and Comparative Physiology (ed. R. Gilles) Springer Verlag, Berlin, pp 163-209, 1990.
5. Swenson ER, Hlastala MP. "CO<sub>2</sub> transport and acid-base balance" in Basic Mechanisms of Pediatric Respiratory Disease: Cellular and Integrative (ed. V Chernick, R Mellins) B.C. Decker, Toronto, p 145-161, 1991.
6. Swenson ER. "Distribution and function of carbonic anhydrase in the gastrointestinal tract. In " The Carbonic Anhydrases: Physiology and Molecular Genetics. (ed. SJ Dodgson) Plenum Press, New York, pp 265-287, 1991.
7. Hlastala MP, Swenson ER. "Airway gas exchange" in The Bronchial Circulation (ed. J. Butler) Marcel-Dekker, Inc., New York, pp 417-441, 1991.
8. Swenson ER. "The role of lung carbonic anhydrase in V-Q matching". in Carbonic Anhydrase: From Biochemistry and Genetics to Physiology and Clinical Medicine. (ed. F. Botre, G. Gros, B.T. Storey) VCH Publishers, Weinheim, pp. 393-403, 1991
9. Swenson ER. "Approach to a patient with respiratory acid-base disturbances" in Textbook of Internal Medicine (ed. W Kelley) Lippincott Co., Philadelphia, pp 1903- 1908, 1992.
10. Hlastala MP, Swenson ER. " Blood gas transport" in Pulmonary Diseases and Disorders: 3rd Edition. (ed. AP Fishman, JA Elias, J Fishman, M Grippi, LR Kaiser, RM Senior. McGraw-Hill Publishers, 1997.
11. Swenson ER. High altitude diuresis: Fact or fancy. In: Women and High Altitude. (ed.) CH Houston, J Coates, Queen City Printers, Burlington VT. 1997; pp 272-283.
12. Swenson ER. Carbonic anhydrase inhibitors and acute mountain sickness. International Society of Mountain Medicine Newsletter. 7:4-8, 1997.
13. Swenson ER. Carbonic anhydrase and the heart. *Cardiologia* 42:453-462, 1997.
14. Swenson ER, KB Domino, MP Hlastala. Physiological effects of oxygen and carbon dioxide. In Complexities in structure and function of the lung. (ed M Hlastala, H Robertson). Marcel-Dekker., New York 1998. pp 511-547.
15. Swenson ER. Empfehlungen fuer Sport bei chronisch obstructiver Pneumopathie. *Therap Umschau* 55:240-245, 1998.
16. Swenson ER. Carbonic anhydrase inhibitors and ventilation: A complex interplay of stimulation and suppression (editorial review) *Eur Respir J* 12:1242-1247, 1998.
17. Swenson ER. Understanding acid-base physiology: Can a strong case be made for the strong ion difference approach? (editorial) *Respir Care* 44:26-28, 1999.
18. Swenson ER. Role of carbonic anhydrase in respiration and acid-base regulation. In: The Carbonic Anhydrases: New Horizons. (ed. WR Chegwiddden, ND Carter, YH Edwards, Birkhauser Verlag AG, Basel 2000, pp 281-341.
19. Henry RP, Swenson ER. The distribution and physiological significance of carbonic anhydrase in vertebrate gas exchange organs. *Respir Physiol*. 2000 Jun 1;121(1):1-12.
20. Swenson ER. " Renal function and fluid homeostasis at high altitude" in High Altitude (ed). T Hornbein, RB Schoene, Marcel-Dekker, Inc., New York 2001; pp 525-568.
21. Schoene, RB, Hultgren H, Swenson ER. " High altitude pulmonary edema " in High Altitude (ed). T Hornbein, RB Schoene, Marcel-Dekker, Inc., New York 2001; pp 777-814.

22. Swenson ER. CO<sub>2</sub> transport and acid-base balance: tissue & cellular. in Basic Mechanisms of Pediatric Respiratory Disease: Cellular and Integrative (ed. Chernick, Mellins) 2nd edition, BC Decker, Toronto, 2002 (in press).
23. Swenson ER. Metabolic acidosis. *Respir Care*. 46:342-353, 2001.
24. Swenson ER. Acid-base adaptation and regulation at high altitude. *High Alt Med Biol.*, 2002 (in press).
25. Kregenow DA, Swenson ER. Carbon dioxide and the lung: Implications for permissive and therapeutic hypercapnia. (editorial review) *Eur Respir J* 2002 (in press).

OTHER PUBLICATIONS (only reports that have not resulted in formal publications are listed)

1. Swenson ER, Renfro JL, Maren TH: Alterations in renal carbonic anhydrase in response to salinity in the euryhaline eel, *Anguilla rostrata*. *Bull Mt Desert Island Biol Lab* 14:127-132, 1974.
2. Maren TH, Swenson ER, Miller DS, Kinter WB: Failure of DDT to inhibit carbonic anhydrase *in vitro* in duck shell gland. *Bull Mt Desert Island Biol Lab* 14:63-68, 1974.
3. Lacy ER, Schmidt-Nielsen B, Swenson ER, Maren TH: The urinary bladder in the little skate, *Raja erinacea*. *Bull Mt Desert Island Biol Lab* 15:56-57, 1975.
4. Swenson ER, Evans DR: Inhibition of gill carbonic anhydrase blocks CO<sub>2</sub> exchange in the isolated saline perfused head of dogfish. *Bull Mt. Desert Biol Lab* 24:72, 1984.
5. Sanyal G, Swenson ER, Maren TH: Studies on dogfish skeletal muscle carbonic anhydrase (CA-III). *Bull Mt Desert Island Biol Lab* 24:53-55, 1984.
6. Swenson ER, Claiborne JB: Effects of gill carbonic anhydrase (CA) inhibition on compensation to respiratory acidosis in sharks, *Squalus acanthias*. *Bull Mt Desert Island Biol Lab* 25:32-34, 1985.
7. Maren TH, Swenson ER: A preliminary note on the buffering of OH<sup>-</sup> by the kidney of *Squalus acanthias*. *Bull Mt Desert Island Biol Lab* 25:42, 1985.
8. Silbernagl S, Swenson ER, Maren TH: Proximal tubular acidification in the isolated perfused kidney of the skate. *Bull Mt Desert Island Biol Lab* 26:156-158, 1986.
9. Swenson ER, Claiborne JB: Carbonic anhydrase inhibition does not alter the rate of recovery from metabolic acidosis in the dogfish. *Bull Mt Desert Island Lab* 26:5-6, 1986.
10. Swenson ER, Fine AD, Maren, TH. Effects of H<sup>+</sup>/K<sup>+</sup> ATPase inhibition on renal and branchial acid-base metabolism in the dogfish shark, *Squalus acanthias*. *Bull Mt Desert Island Biol Lab*. 32:89-91, 1993.
11. Gehnrich SC, Lippincott LH, Swenson ER, Maren TH. Carbonic anhydrase in the kidneys of euryhaline fish. *Bull Mt Desert Island Biol Lab*. 33:61-63.1994.
12. Gehnrich SC, Lippincott LH, Swenson ER, Maren TH. Further attempts to separate renal from hematopoietic tissue in euryhaline eel, *Anguilla rostrata*. *Bull Mt Desert Island Biol Lab* 34:96, 1995.
13. Swenson ER, Lippincott LH., Maren TH. Effect of membrane bound carbonic anhydrase inhibition on gill bicarbonate excretion in the elasmobranch shark. *Bull Mt Desert Island Biol Lab* 34:94-95, 1995.

ABSTRACTS AND LETTERS: (only those not resulting in formal publications are listed)

1. Barbee RW, Stainsby WN, Swenson ER: Dynamics of tissue gas exchange during successive stimulated exercise bouts. *Med Sci Sports Exer* 12:A314, 1982.
2. Swenson ER, Aitken ML: Hypokalemia with inhaled albuterol. *Am Rev Respir Dis* 131:A99, 1985.
3. Swenson ER, Martin TR, Albert RK, Carlson L, Plorde J: Antibody coating of airway bacteria occurs in chronic bronchitis. *Am Rev Respir Dis* 131:A94, 1985.
4. Leasa D, Swenson ER, Gard R, Hlastala MP: The acetylene rebreathing technique does accurately estimate lobar capillary blood flow. *Am Rev Respir Dis* 131:A348, 1985.
5. Hackett PH, Swenson ER, Roach RC, Mills WJ: 250 mg Acetazolamide intravenously does not increase cerebral blood flow at high altitude. 5th International Hypoxia Symposium, Alberta, 1987.
6. Hackett PH, Swenson ER, Roach RC, Mills WJ: Subclinical pulmonary edema in acute mountain sickness. Fifth International Hypoxia Symposium, Lake Louise, Alberta, 1987.
7. Christensen P, Gronlund J, Svendsen P, Swenson ER: New method for continuous measurements of ventilation perfusion index in the pig. *J Physiol* 387:199P, 1987.
8. Brahm J, Gronlund J, Hlastala MP, Ohlsson J, Swenson ER: *In vivo* inhibition of RBC anion exchange and Haldane effect on CO<sub>2</sub> output. *J Physiol* 390:245P, 1987.
9. Claiborne JB, Swenson ER: Effects of gill carbonic anhydrase inhibition on recovery rate from metabolic and respiratory acidosis in the dogfish. *J Physiol* 391:63P, 1987.
10. Swenson ER, King PA: Red cell, gill and renal responses to anion exchange inhibition in the shark, *Squalus acanthias*. *FASEB J* 3:A557, 1989.
11. Swenson ER, Maren TH: Acute mountain sickness. *New Engl J Med*, 320:1492-1493, 1989.
12. Swenson ER, Rhodes CG, Araujo L, Pike V, Le Bars D, Effros RM, Hughes JMB. Intrathoracic localization of tissue carbonic anhydrase in dogs studied with PET. *Physiologist* 32:210, 1989.
13. Yamashiro SM, Swenson ER, Middaugh ME, Hlastala MP. Effects of body position and end expiratory pressure on gas exchange in normal dogs. *Physiologist* 32:224, 1989.
14. Robertson HT, Glenny RW, Swenson ER. Regional ventilation assessed by positron emission tomography (PET) scans of <sup>13</sup>N<sub>2</sub> washout. *FASEB J* 6:A1477, 1992.
15. Robertson HT, Polissar NL, Glenny RW, Swenson ER, Graham MM. Measurement of the spatial heterogeneity of regional ventilation by PET: Two estimates correcting for methodological noise. *FASEB J* 8:A229, 1993.
16. Steele B, Massey L, Bekins R, Swenson ER, Lakshminarayan S. Higher hematocrit in smokers on supplemental oxygen. *Am J Resp Crit Care Med*. 149: A790, 1994.
17. Campbell AR, Wanderwerf SM, Swenson ER. Effects of CA inhibition on neutrophil chemotaxis and superoxide generation. *FASEB J*. 9:A634,1995.
18. Collier D, Nathan J, Flower R, Swenson ER, Milledge JS. Benzolamide, a renal-selective CA inhibitor, prevents acute mountain sickness in man. *J Physiol*. 523:A245, 1996

19. Hildebrandt W, Biollaz J, Swenson ER, Bartsch P. Exaggerated hypoxemia precedes worsened gas exchange in acute mountain sickness. 10th International Hypoxia Symposium, Lake Louise, 1997.
20. Brogan TV, Hedges GR, Alberts MK, Swenson ER. Effect of inspired CO<sub>2</sub> and NO synthase inhibition on V<sub>A</sub>/Q matching and blood flow distributions in rabbits. FASEB J12:A432,1998.
21. Elser H, Swenson ER, Hildebrandt W, Busch T, Gruenig E, Bartsch P. Regional distribution of pulmonary perfusion after five hours of normobaric hypoxia in subjects susceptible to high altitude pulmonary edema. Eur Respir J. A2328, 1998.
22. Swenson ER, Maichel B, Lakshminarayan S. High prevalence of shunt in COPD patients evaluated for lung volume reduction surgery. Am J Respir Crit Care Med 159:A822, 1999 .
23. Swenson ER, Berg JT, Kerr ME, Deem S. Diffusion of CO<sub>2</sub> via aquaporin-1 does not contribute to pulmonary CO<sub>2</sub> exchange. FASEB J 13:A496, 1999.
24. Swenson ER, Brogan TV, Souders JE, Domino KB. Addition of CO<sub>2</sub> in late inspiration improves VA/Q matching. FASEB J 13:A496, 1999.
25. Busch T, Swenson ER, Hildebrandt W, Grunig E, Kaisers U, Bartsch P, Falke KJ. Autoinhalation of nasal nitric oxide improves arterial oxygenation during prolonged hypoxia. Am J Respir Crit Care Med 159:A842, 1999 .
26. Krebs MO, Boehmke W, Seiferheld M, Kaczmarczyk G, Swenson ER. Acetazolamide prevents HPV in conscious dogs. In: Hypoxia: Into the next millennium (ed) Roach, RC, Wagner PD, Hackett PH. Kluwer Academic/Plenum Publishers. New York, 1999; p 398.
27. Hopkins S, Schoene RB, Stratton JB, Swenson ER. Garlic ingestion reduces hypoxic pulmonary vasoconstriction in humans. In: Hypoxia: Into the next millennium. (ed) Roach, RC, Wagner PD, Hackett PH. Kluwer Academic/Plenum Publishers. New York, 1999; p 390.
28. Vaughn DJ, Brogan TV, Kerr M, Deem S, Swenson ER. The source of exhaled nitric oxide in isolated perfused lungs. Am J Respir Crit Care Med 161:A138, 2000.
29. Weymann J, Swenson ER, Gibbs S, Maggiorini M, Bartsch P, Mairbaurl H. Nasal epithelium Na- and Cl-conductance in HAPE -susceptibles in normoxia and hypoxia. Am J Respir Crit Care Med 161:A466, 2000.
29. Swenson ER, Mongovin SM, Gibbs S, Maggiorini M, Mairbaurl H, Bartsch P. Stress failure in high altitude pulmonary edema. Am J Respir Crit Care Med 161:A418, 2000.
30. Nickol AH, Swenson ER, Milledge JS, Collier DJ. Abolition of the ventilatory response to timed inspiratory CO<sub>2</sub> pulses in man using the carbonic anhydrase inhibitor, acetazolamide. Am J Respir Crit Care Med 163:A624, 2001.
31. Swenson ER, Mongovin SM, Gibbs S, Maggiorini M, Mairbaurl H, Bartsch P. Alveolar macrophage cytokine responses to hypoxia and lipopolysaccharide in high altitude pulmonary edema resistant and susceptible mountaineers. Am J Respir Crit Care Med 163:A618, 2001.
32. Swenson ER. Update: High altitude pulmonary edema. High Altitude Med Biol 2:82, 2001.
33. Maggiorini M, Swenson ER, Mairbaurl H, Joller H, Gibbs S, Bartsch P. Elevated interleukin 6 in plasma suggests stress failure of the pulmonary capillaries in high altitude pulmonary edema. High Altitude Med Biol 2:83, 2001.
34. Mairbaurl H, Hoschle S, Schwobel F, Maggiorini M, Swenson ER, Gibbs S, Bartsch P. Altered expression of sodium transporters in HAPE-susceptibles in high altitude hypoxia. High Altitude Med Biol 2:88, 2001.

35. Schoene RB, Jefferson JA, Esudero E, Hurtado ME, Pundo J, Topia R, Russell K, Swenson ER, Schreiner GF, Hurtado A, Johnson RJ. Excessive erythrocytosis, chronic mountain sickness and pulmonary gas exchange in the Andes. High Altitude Med Biol 2:88, 2001.
36. Mairbaeurl H, Weymann J, Mohrlein A, Maggiorini M, Swenson ER, Gibbs S, Bartsch P. Decreased Na but not Cl transport across the nasal epithelium in high altitude hypoxia. High Altitude Med Biol 2:98, 2001.
37. Gibbs JSR, O'Brien A, Parker K, Maggiorini M, Swenson ER, Bartsch P. Differences in pulmonary hemodynamics between acute hypoxic and chronic pulmonary hypertension. High Altitude Med Biol. 2:99, 2001.
38. Nickol AH, van Ruiten H, Swenson ER, Wolff CB, Milledge JS, Collier DJ. Abolition of the ventilatory response to timed inspiratory CO2 pulses in man using the carbonic anhydrase inhibitor, acetazolamide. Am J Respir Crit Care Med 163:A624, 2001.
39. Maronian N, Daniel TL, Swenson ER, Waugh PF, Hillel AD. Direct measurement of subglottic pressure in normal subjects. Am Bronchesophag Assoc meeting , 2002.

**APPEARS THIS WAY  
ON ORIGINAL**